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LEARNING PROCESS



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SERIES FOR TEACHERS



LEARNING PROCESS

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F O R E W O R D

There is a dearth of psychological literature written in popular style although psychological findings are of great use to the class-room teacher, parents and administrators. Very little attempt has been made to bring the results of psychological and educational research to the notice of educational workers in India.

The National Council of Educational Research and Training has undertaken to publish a series of pamphlets on various educational and psychological topics with a view to making research findings available to educational workers. The pamphlets will discuss scientific principles supplemented with numerous examples from teaching situations.

The present pamphlet which is part of the N. I. E. series of pamphlets is an attempt to discuss learning process from the teacher's point of view. Although learning is the central theme of educational psychology, it has not received sufficient attention of the educators. The author has tried to point out that it is necessary for the teacher to inquire closely into the learning process of children ; it is also important to recognise the role of the teacher in providing suitable learning experiences. She emphasises the need of evaluating outcomes of learning and keeping the learner informed of the results. Such knowledge of results is a great incentive to the learner to achieve more.

I am sure that the pamphlet will be of use to parents, teachers and administrators interested in the learning process.

Delhi
December 24, 1963

P. K. Roy
Central Institute of Education

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SECTION I

THE TEACHER STUDIES THE LEARNING PROCESS

From the Point of View of Educational Goals. In our every-day life experiences, we teachers, shuttle back and forth continually to find the goals and principles of sound education in order to direct and shape the lives of our pupils so that they may become useful members of their society as well as of a humane world, on the whole. In doing so, we look up to the attainment of human excellence in the areas of intelligence, creativity, conscience and reverence. This cherished goal of ours not only challenges us to understand these values but also compels us to know how best these ideals can be realised by our pupils in the course of their different stages of growth and development as adult human beings. And it is in this context, that the learning process in human life gains importance. Thorpe adds, 'An educational system is built upon certain purposes which become implicit through the learning process.'

From the Point of View of Society. In this age of science and technology our society has become very complex in all aspects of living and it thus places a great premium of social demands on the growing child as a learner. The accumulation of culture and the development of highly specialised disciplines in different fields of knowledge have necessitated the expansion of the present day curriculum in schools. Along with this expansion, there has also arisen the question of selectivity : 'What to teach.....and how best to teach.....' in order that both the quantum of knowledge and the quality of learning of the individual may result in mutual personal and societal gains. At this point, the practising teachers have to be cognisant of the fact that this individual versus society adjustment can only be possible if they realise the importance of developing an effective teaching-learning process. On the contrary, an ineffective teaching-learning process may lead directly to an individual and a family loss with regard to human energy, time, money and job placement, which indirectly may result in a societal

loss. As we all know, it is the society which ultimately shoulders the liabilities of its individuals.

From the Point of View of an Individual. As the normal child grows chronologically, he forms good habits, gradually learns many social skills and develops wholesome interests and attitudes. In his daily life, he continually puts these skills into practice. How successfully the child is able to perform his skills will depend upon the type of interest and the kind of attitude he has developed towards that particular job. These modifications in the behavioural pattern of the child during the period of his growth do not take place in a vacuum. He grows and develops within the society into which he is born. This 'personal development' as a layman would call it, is really the sum total of the development of all aspects of personality (physical, intellectual, social, aesthetic and moral) which are interwoven and inter dependent, to some degree. One or a combination of two or three of these aspects may influence the acceleration or retardation in one or two other aspects of the same personality. This inter-relationship among various aspects of growth and development in a child has led us to believe that teachers can never engage themselves in helping children gain intellectual maturity without being aware of its relationships to other aspects of personality such as social, emotional and physical.

Let us take each of these aspects separately. Physically, the child grows from infancy to manhood. Physical and physiological changes take place within an individual in this process of maturation to adulthood. Socially, the child begins as a social being at the stage of infancy. Soon he becomes altruistic in his outlook, at the childhood stage. During this period, the child starts to realise that there are people around him with feelings like those of his own and he has to take account of these persons in his daily undertakings. In this continuous process of his growth, when he becomes an adolescent, he develops idealistic tendencies. His conduct, then, is influenced and guided by certain ideals and principles which he has started to believe in. This may be so in the context his family or school relationships, economic life, religious belief and even moral standards. His emotional development takes place when he gradually acquires the power to control his emotions like anger, hatred, aggression, etc. He is said to develop aesthetically when he learns to appreciate the things of beauty and to hate the ugly. A child starts developing

intellectually when he learns to make simple responses to his immediate environment. The child may cry when he is hungry. He may kick his feet when the toys are taken away from him. He may again smile at the sight of his mother. Along with the acquisition of such skills, the child slowly begins to develop verbal skills. As he grows older, he is able to solve easy problems together with what he has already learnt. Gradually, he learns to solve more and more problems which require high degree of verbal ability. Later on, all these help him to gain insight into critical and creative processes of thinking. When the child is able to differentiate between the right and the wrong and thus can make a right decision out of many alternative ones, he is said to be making a moral judgment. This is an example of the development of the moral aspect of his personality in the wider sense of the term. It may be mentioned here, again, that no dividing line can be drawn between any of these forms of learning. These have been separated only for the sake of convenience. In real life all these forms of learning take place simultaneously as they are inter twined and inter-dependent. That's why Lindgren has said: "Social maturity is to some extent basic to intellectual maturity, because it is concerned with the context in which intellectual maturity expresses itself. Emotional maturity is probably basic to both intellectual and social maturity, because the individual's behaviour is so largely governed or conditioned by his feelings. Whether an individual learns at all depends, for example, on whether he is motivated to learn. Perhaps, physical maturity is the most basic dimension of all, because it helps to set the pace for all other forms of maturity. The details of the development of many aspects of personality that have gone above are meant to show that, to a child these are all but challenging, 'learning tasks' or 'developmental tasks' and how efficiently he performs these depends partially on his own environmental mastery. In this adventure of gaining maturity, the child needs the right assistance and guidance from the elders. We, teachers, can give adequate and appropriate help to our pupils if we know how to make their learning effective and meaningful so that thier earlier learning may enable thier to further his later learning.

From the Point of View of Classroom Teaching. It is, therefore, important for the teachers to know :

- (i) The factors which are conducive or detrimental to human learning.

- (ii) What and how individuals learn. [Eventually, the teachers will be in a position (a) to provide opportunities for the required learning experiences ; and (b) to know what and how to evaluate child's learning.]
- (iii) Whether the outcomes of learning are in consonance with the educational goals that are set up.

Psychologists and educators are equally convinced that 'the nature of the learner's activities is a most important problem in educational procedure. To understand how human beings learn is, therefore, basic to the attainment of competence in teaching.'

SECTION II

THE TEACHER FINDS OUT WHAT LEARNING IS

Animal and Human Learning. In order to discover significant facts about human learning, different types of experiments under controlled conditions had been conducted to study interesting features of learning in animals. These experiments with animal learning have proved that such records of animal studies are not adequate enough to formulate general principles of human learning, though these are of great help in understanding human learning process in many respects.

Cole and Bruce have pointed out the following differences between animal nature and human nature.

Animals do not make use of symbols as human beings do. The great achievement of humanity is its ability to use language for the purpose of speaking, reading and writing. Man has also realised his essential rationality in another form of symbolic activity *i.e.* mathematics, which is said to be one of the expressions of human reasoning.

Animals neither acquire great range of physical and social skills nor the degree of dexterity found among human beings. These differences can be seen in man's mastery of his innumerable bodily skills and again, in the realm of his environmental mastery.

Animal-perceptions of complex relations are less acute. It is in the nature of man to enquire into the meaning of things, to comprehend the relationships between things, to compare and contrast these to find contradictions or otherwise. In order to understand, he proposes to analyse on one hand, and explores possibilities to synthesise, on the other. These kinds of thought processes are not possible in animals.

Animal-responses are immediate and impulsive, but man is said to be a 'rational animal', in which case he employs his reasoning power to criticize the existing mode of thinking to create new form of ideas.

Animals are not socially sensitive to the degree as human beings are. A man has to develop satisfactory and effective relationships with others which may make his living pleasant.

Animals do not develop cultures and transmit them as human beings do. Culture compares the acquired power of control of man on himself and nature. For example, 'culture includes knowledge, beliefs, art, moral law, government, manners and customs and any other capabilities and habits acquired by man as a member of society.' This is impossible in the case of animals.

At this point, it is worthwhile to note that a human mind is capable of knowing, feeling and willing. These three functions of the mind : cognition (knowing), affection (feeling) and conation (willing) are inseparable. As a result, any act of knowing on the part of the individual is always charged with some degree of feeling and willing.

Take the case of Mohan. He learns that he has earned distinction in the examination. He gains self-confidence and determines to do well in all his future undertakings. Suddenly, he becomes sad remembering that the teacher who inspired him in his hard work died only yesterday. He is no more to share with him this rejoicing. He feels frightened to think whether any of his future successes be again combined with the loss of any one of his dear ones.

Similarly, Arun gets the news of his failure in English in spite of his hard work. This makes him hate both the subject and the teacher. He then resolves to cheat in order to get more marks in English.

Often we hear teachers say : Hari is intelligent, but he is lazy. He hates school work. Hence, his performance in the class is unsatisfactory.

From all these examples, it is apparent, therefore, that human learning can be directed towards habits and skills ; knowledge and understandings ; and attitudes and ideals.

POINTS OF VIEW AND INTERPRETATIONS

It is difficult to establish any law of learning as this foregoing term indicates universal applicability of something and learning is an active process of the individual. We, teachers, know from our

experience that all pupils do not learn the same thing, at the same rate, and at the same time. Again, there can be no perfect measurement of human nature as contrasted with that of physical or chemical elements which can be controlled to the minutest exactitude. So it is only possible to lay down, certain basic or general principles of learning.

Learning may be considered a process and not a product. For example, in the learning of language skills some changes are brought about in the performance of the individual. A child begins to learn new words. After a while, he possesses a large stock of vocabulary. It is not the end product which is learning, but the process through which this particular skill has been acquired.

Both learning and maturation are processes through which behaviour changes. But these are not identical terms though these are very closely related to each other. Maturation is the process by which behaviour is changed as a result of physical and physiological growth of the individual. A child's learning is affected considerably by merely growing older. In other words, one of the significant factors in learning is the 'course of growth and maturation.' The basic responsibility of the teacher is to assist the child to tackle school tasks most fitting to his age.

Through the process of learning an individual may change his behaviour in forming good habits or in acquiring certain skills which in turn may enable him to make happy adjustments in life. On the contrary, one may learn habits or skills which are not conducive to his mental health or to his happy social existence. As teachers, we must be obliged to promote learning in children in such a manner that they may make satisfactory adjustments in all phases of life. Learning, therefore, may take positive or negative direction in which case the outcome of it may be either favourable or unfavourable. teacher's task is of great magnitude in the case of the latter. In this case, the teacher with patient labour has to help the child unlearn his bad habits, skills and attitudes and then teach him to learn good ones.

Depending upon the organised or unorganised activities that are involved in the process of learning it may be said to be intentional or unintentional. Much of the formal learning of the school, in which the child is engaged in and which constitutes the systematic organised programme of activities may be called

intentional learning. Again, an individual during his daily activities of life, unconsciously learns many things which are the results of his experiences. This may be termed as unintentional or incidental learning. Teachers need to be aware of these environmental factors which influence this incidental learning, so that he is able to use this incidental learning with great advantage in his formal teaching of school subjects. In some instances it may be noticed that incidental learning may be incompatible and inconsistent with the formal learning of the school. Teachers ought to be cognisant of these and at the same time be able to tackle the situation so as not to allow any hinderance to take place in the learning of the individual.

Educators believe and emphasize the fact that pupils learn not only from the task which is given to them but also from those related to the one on which they work. During their experiences they may also develop a sense of appreciation for all kinds of similar work and this may help in building up the right kind of attitudes and ideals. Take learning of ceramics as an example. Primary learning takes place in pupils when they acquire skills to use clay for making different kinds of objects. In addition to these, the pupils may also learn in the course of the work about different kinds of clay, their source of availability, their characteristics and properties and their formation as earth's crust, etc. This may be called associated learning. Further, they may also develop a sense of respect and appreciation for the craftsmen in ceramics which may transfer to gain sympathy for all craftsmen and in their jobs. This is concomitant learning. We teachers should always endeavour to focus our attention in teaching the young not only on their primary learning but also on relating it to its associated and concomitant learning. Then learning may have its full significance to the learner.

In knowing the physical feature, climate, flora and fauna, people and their occupations of India the pupils may also learn how the people of India are trying their best in promoting to develop agriculture, industry, education, etc. in order to raise the economy of the country. In doing so, the pupils begin admiring their people, their planning and their aspirations and soon develop a true national spirit which in turn is of great help to them when they grow up to work for cooperation and social integration. Teachers

should realise all these outcomes in the process of their teaching-learning situations.

Another important fact about learning is that factors which facilitate learning may sometimes deter it. It is true that practice and repetition may affect perfection in learning. In some cases, practice may also result in fatigue, which is detrimental to learning. An alert teacher takes note of all these factors in his teaching.

Learning may operate at two levels: both vertically and horizontally. Learning is horizontal when it is organised to form an integral part of the ever-expanding and total experience of the learner, in which instance the child can be said to learn swimming, painting, singing, writing, etc. Learning is vertical when the performance of the learner gains improvement in the direction of perfection, viz. in piano playing. Teachers need to attend to both these levels of learning in children: quantitative as well as qualitative.

Improvement in learning takes place as wrong responses decrease and right ones increase and get fixed. The results of progress in learning can be expressed in the form of a graph which is called the learning curve. This curve illustrates the rate of improvement and the changes in the rate. In a learning curve one may notice a rapid rise in the beginning of the curve. A gradual progress then follows and reaches a level of no improvement and finally, a spurt is shown at the end of the task. This level of no improvement is called a plateau in learning, which may be due to very many causes: physical or psychological. 'Psychologists are inclined to believe that plateaus are not necessary features of learning progress.' When this occurs the teacher should make an attempt to find out the cause or causes and help the learner to progress in his work.

Many attempts have been made to define learning but so far no one has been able to give an accepted and adequate definition of learning. However, it is much easier to describe and explain what takes place in human learning, as has been done above.

In the Dictionary of Education, the term 'learning' has been interpreted to mean: 'Change in response or behaviour (such as innovation, elimination or modification of responses, involving

some degree of performance) caused partly or wholly by experience, such experience being in the main conscious, but sometimes including significant unconscious components, as is common in motor learning or in reaction to unrecognised or subliminal stimuli ; includes behaviour changes in the emotional sphere, but more commonly refers to the acquisition of symbolic knowledge or motor skills, does not include physiological changes, such as fatigue or temporary sensory resistance or non-functioning after continued stimulations.'

Munn defines learning as 'the process of being modified, more or less permanently, by what happens in the world around us, by what we do, or by what we observe.'

After Hunter and Hilgard, the definition may be in the following words : 'Learning is the process by which behaviour (in the broader sense) is originated or changed through practice or training.'

Kingsley and Gary, after analysing the common features of learning define it as follows : 'Learning is the process by which an organism in satisfying its motivations, adopts and adjusts its behaviour in order to overcome obstacles or barriers.'

Mr. Geoch is not in favour of a rigid definition of the learning process and instead makes a general statement as the following : 'Learning, as we measure it is a change in performance which occurs under the conditions of practice.'

To Commins and Fagin, 'Learning is a sequence of mental events or conditions leading to changes in the learner. As a sequence of events, the learning process is as follows : (1) The individual has needs and is therefore in a state of readiness to respond. These are antecedent conditions within the learner. (2) He meets a learning situation or problem. A new interpretation is required because previously learned responses are not adequate for reaching the goal and satisfying his need. He encounters something new or unexpected, and must search for a different response. (3) He interprets the situation with reference to his goals, and tries a response or responses which seem to satisfy his need. The way he perceives the situation and the response he makes depends both on his 'readiness' and on external conditions of the situation. (4) If his response leads to devised goals or

satisfaction, will tend to interpret and respond to similar future situations in the same way. If not, he keeps on trying and re-interpreting until satisfying consequences are attained. The learning process is this whole sequence.'

For our purpose as teachers the following broad definition of learning may suffice : 'Learning is the process of acquiring new information, new or changed ways of responding, new understanding.'

An analysis of these various definitions that are given above draws out two inferences : one, there are certain general characteristics of learning; and two, there are factors which influence learning.

It is evident from these definitions that learning in different fields of behaviour depends :

- (i) on the capacity and motivation of the learner, himself ;
- (ii) on the meaningfulness and difficulty of the learning tasks ;
- (iii) on methods in which the learning materials are presented to the learner ; and
- (iv) on the interaction between the above variables.

The characteristics of learning may be enumerated as follows :

Learning is purposive or goal directed. Human beings always learn to achieve something. Sometimes the teachers may not be aware of it at all. When the goal is more definite and explicit, the learning becomes more meaningful and effective to the learner.

Learning is an active process. Learning is a form of activity and it largely depends on the learner. It is said that no learning can take place where there is no self-activity. That is why one psychologist has said : 'No one can teach you but you may learn, your teacher can direct your learning, can show you how materials are derived or related and stimulate you to study. Whether or not you learn and what you learn depend upon what you yourself do, for learning an activity.'

Learning is individual. Each learner is a unique person who has his individual needs and problems, interests and attitudes, purposes and aspirations. In some, learning may be quick and fast ; in others, the reactions may be slow ; and still in others, it may be steady and deliberate.

Learning is socially conditioned. Learning is not only individual but in a sense also social, because learning takes place in response to the social environment of the individual. A child's social interaction is of great significance to his favourable or unfavourable learning. An intelligent teacher takes note of the social climate in the classroom, the influence of peer group on a child and so on.

Learning is the response of the whole individual to the total situation. Learning is unitary as man learns as a whole being. An individual reacts as a whole person to the total learning situation rather than to one single stimulus. Since each learner responds as a whole (physically, socially and emotionally) the various motivating factors within him which effect the learner must be taken into account for effective teaching. Again, as the learner responds to the total situation, all external or environmental factors which influence his responses must also be taken note of for favourable learning. Therefore, setting the environment for learning is so very important.

Learning is creative. It is a new way of acting, as all true learning tasks take into account some selective responses. It is not merely the summing up of all previous knowledge and experience, it is a creative synthesis of all the knowledge and the experience of the learner. Here lies the difference between animal learning and human learning. In human learning the following mental processes are involved as cited by Crow and Crow (1954) :

- (a) Interest and attention directed towards a goal—direction,
- (b) Perception of relations—interpretation,
- (c) Selection and recall of relevant experiences—selection,
- (d) Recognition of relationships among the component experiences—insight,
- (e) Formation of new mental pattern—creation,
- (f) Evaluation of the workability of solution—criticism.

True human learning should aim at the higher level of thinking i.e. creative and critical thinking.

Learning is transferable. Transfer to new tasks become more meaningful and advantageous to the learner when he has already discovered relationships between things and has learned to apply

the principles within a given number of tasks. Learning is transferable in this way, but the amount of transfer may vary. There is no wholesale transfer from one subject to another as had been supposed earlier by the theory of formal discipline. Transfer is possible between the two situations, if there is identity of context, identity of procedures and identity of attitudes and ideals. In this way transfer takes place from one field of study to another and from the classroom situations to life situations. This transfer is also essential, as it leads to economy in learning.

SECTION III

THE TEACHER ENQUIRIES HOW CHILDREN LEARN

The answer to the question : 'How children learn?' may be given in two ways : first, by describing the phases of learning ; and second, by presenting different approaches to learning.

PHASES OF LEARNING

It is convenient to analyse the complex process of learning into three phases. We human beings are intellectually aware of so many things around us. Beyond this, we also have the ability to retain and recall them when they are needed. In the acquisition phase new responses or changes in behaviour are acquired. This can also be named original learning. It is not enough to know how new responses are acquired. We should also know how to retain and not to forget that we have already learnt. This is called the retention phase of learning. The third and the last phase of the learning process is the recalling phase. True and complete learning is said to comprise all these three phases : acquisition, retention and recall. Let us study these one at a time.

Acquisition phase. This phase of learning means to make impressions on the mind. It is, therefore, evident that one has to pay attention to what is to be learned and remembered. At this stage comes the importance of the role of attention and perception in learning. Perception does not merely mean seeing an object but seeing it with meaning. In order to give meaning and significance to the new situation one is helped by his past experience. So perception, in other words, means drawing meaning from experience. How much an individual does learn depends upon his perception and the amount of attention he has paid to the learning situation. When the individual is motivated to the learning situation through inner drive, desire, need or urge his attention is automatically voluntary. For example a child's interest in gramophone, radio, television may motivate him to learn science. When external motivation or incentives (praise or reward) are used for the learner

to learn, then the attention that he gives to the learning situation may be called an involuntary one. Both kinds of motivation are useful to the learner depending upon the situations in learning.

Psychologists affirm that the child's mind is not an empty bottle in which the teacher can pour anything and in any amount that he wishes. The child must also possess the capacity to receive and learn the thing that the teacher wants to teach him. This is known as child's mental set or readiness to learn. This readiness may be the result of many different factors within the child : his maturation level, age, sex, previous experience, interest, intelligence, aptitude, attitude, physical handicaps, motivation and the mood of the moment. Psychologists explain this stage by the Law of Readiness which was enunciated by Thorndike as :

- (i) 'That when a conduction unit is ready to conduct, conduction by it is satisfying, nothing being done to alter its action,
- (ii) that for a conduction unit ready to conduct not to conduct is annoying, and provokes whatever responses nature provides in connection with that particular annoying lack,
- (iii) that when a conduction unit unready for conduction is forced to conduct, conduction by it is anything.'

This psychological readiness on the part of the child is prerequisite to the acquiring of any kind of learning. In popular parlance it is often said : 'You may take a horse to the drinking pool ; but it depends on the horse whether it wants to drink water or not.'

Fixation phase. The second phase of learning is retention. The issue at hand is : What is the best way to remember things ? As we all know, we tend to forget the things we have learned if we do not use them. To this context, psychologists have recommended over-learning as opposed to under-learning. Many things are remembered almost for the entire life-time of an individual, if these have been over-learned. This means that the materials have to be drilled and repeated, off and on, well beyond the point whether it can be recalled. In view of the above, it is clear that one should

not be satisfied with the minimum amount of study but drill oneself beyond the level of just recall for remembering things.

Thorndike's Law of Exercise is a formulation of this principle. According to him, 'the strength of a stimulus-response connection is increased by use or exercise' and conversely, his Law of Disuse states that 'the strength of such a connection is decreased when it is not exercised.'

Later he revised this assumption and formulated his Law of Effect : 'When a modifiable connection between situation and response is made and is accompanied or followed by a satisfying state of affairs, that connection strength is increased. When made and accompanied or followed by an annoying state of affairs, its strength is decreased.' This rests on his conviction that 'an organism tends to repeat that which has previously been satisfying and avoid that which has been dis-satisfying. Thus, favourable outcomes strengthen connections between responses and stimuli.' Through his later researches, Thorndike concluded that exercise alone cannot result in learning. Practice and repetition bring about certain circumstances under which Law of Effect works and this results in learning.

Application Phase. The third phase of learning is recall. Learning is said to be complete only when the learner can recall the material to memory when it is needed. In this connection, Aristotle propagated his Principle of Contiguity as follows : If a thing is to be remembered, it must be associated contiguously with something else. If it is to be recalled it must be recalled contiguously with the former associated idea, which means that our experiences are not stored up in the mind in a crude unrelated way. They are tied up together in accordance with certain mental principles. This explanation of recall to memory is also framed in Thorndike's Primary Law of Association which runs thus : 'Of two things previously experienced together, the entrance of one into the mind tends to draw in the other also. If the teacher wants to bring two ideas together, 'freezing point' and 'zero degree' in the child's attention, then the child must be given the chance to experience this.'

There are two other laws of association : the law of similarity and the law of contrast. Similar ideas get associated

together. So also any idea tends to suggest its opposite. In this respect teacher's cooperation helps the learning of the child.

Thorndike went further and formulated his Secondary Principles of Association which are Recency, Frequency, Primacy and Intensity.

Recency : 'The more frequently two associates have been experienced together, the more likely is the presence of one of them in the mind to draw in the second than it is any one of the scores of other associates that have been connected with it at various times and under various circumstances in the past.' It is said that pupils make use of the Principle of Recency when they cram at the last moment for any examination.

Frequency : 'Of several ideas previously experienced together, when one is in the mind it will tend to draw in the one that has been most frequently experienced.' If one associates $7+8$ with 15 and not with 13, it is because the previous associations have been made that way.

Primacy : 'The first or earliest association formed between two ideas sometimes operates preferentially, even after other associations have been made more often or more recently.' We often find that our first impressions are always vivid and clear than any other after-experiences.

Intensity : 'Sometimes an experience is so intense or emotional that whenever any element in it is subsequently present in the mind, other elements that we re-associated originally with it tend to come plunging back into consciousness.'

TEACHER'S QUERIES

The study of the phases of learning may raise a few queries in the mind of the teacher as the following :

1. What are the best ways of acquiring different forms of learning like : motor skills, perception, rote learning, comprehension, problem-solving, emotional activity, attitudes and ideals ?
2. Can practice and repetition alone bring about effective learning ? What is the role of fatigue or emotion in learning ?
3. In what way can perception be developed and modified ?
4. What part does motivation play in learning ?

5. Can the Laws of Exercise and Effect and Principles of Associations exclusively be applied to affect all kinds of learning as there are several other factors (mentioned earlier) influencing it ?

6. Is it always important to retain or recall facts or specific information ?

7. Can these laws really help in developing attitudes and ideals in individuals ?

8. How does transfer of learning take place ?

APPROACHES TO LEARNING

Many of the questions raised in the last section may be fruitfully answered when we describe the different ways of acquiring knowledge, habits, skills, attitudes and ideals. There is no 'one way' of learning. The three approaches to learning are the conditioned response, trial and error and insight. By understanding how each approach operates, the teacher may employ pupil's learning experiences to the process most adequate for his purpose.

Learning by conditioned response. In the pattern of conditioned response learning one connects a response with a stimulus which did not produce that response earlier. It was the Russian physiologist, Pavlov, who first made the classical conditioned response experiment on a dog—its capability of salivating to food and to the sound of a bell.

By conditioning one does not learn to do new things but learns to form new connections between a stimulus and a response : That is to say : the dog is already capable of salivating to food. What it learns is to salivate to the ringing of the bell. The question is how can this connection be established or how is the skill learned and once learned how can it be retained and recalled ?

1. This may need many repetitions. The conditioned stimulus (bell) is repeatedly presented first before the unconditioned one (food).

2. If the conditioned response connection is favourable or rewarding, then there is every chance of forming this connection by lesser number of repetitions. If the dog is rewarded with food almost every time, the connection is established quickly. Conversely, if the dog is not rewarded this connection weakens.

3. It has been noted that the shorter the time interval between the conditioned stimulus and the unconditioned one, the faster the conditioned response is established i.e. the food must be presented immediately after the ringing of the bell if one wishes the dog to salivate.

In view of the above, one conclusion may however be drawn that conditioned response gains in strength with each repetition and favourable or satisfying nature of its results ; and it becomes weak unless it is often rewarded.

4. The connection may again be broken by interference. Suppose, the sound of the bell is followed by an electric shock. The dog instead of salivating will start to groan. Therefore, while using this method it is important to remember to give the right stimulus to the expected response to obtain the correct connection or else wrong connections may be formed.

5. The best way to form a conditioned response with lesser number of repetitions is to see a close relationship in the new connection between the food and the ringing of the bell.

6. Reconditioning is also possible through this process. It means to unlearn the unwanted responses by controlling the learning situation.

In children's learning when the teacher wants them to form stimulus-response connection, he may follow this learning pattern. Children learn their habits of behaviour through conditioning. This method is helpful to young learners when it becomes difficult for adults to give meanings to everything. It is also useful when children are dealing with functions that are learned in some specific ways. Thus, the learning of synonyms and antonyms in the vocabulary lends itself to conditioning : The children already know the words like black, white, long, short etc. Only thing they learn is to form new connection of 'same meaning', or 'opposite meaning' between these words.

Automatic responses rather than reflective thinking is needed in the learning of spelling the words. It is often found that in many of our school subjects, automatic or consistent responses are of great importance. A good learner always learns these so that 'they may serve as time and energy saving habits.' It is, therefore, the function of the teacher to provide the principles of condi-

tioning in those learning situations in which automatic response is most effective. At the same time, the teacher must be on his guard not to make the pupils do things in the way he wants them to do to get the expected results. Pupils may tend to do things without any kind of understanding. Further, it will lead to maximum amount of drilling and rote memory.

This approach to learning can be used also to unlearn many unwanted responses, by controlling the learning situations. A child may be afraid of darkness. Light in the room may be gradually reduced under controlled conditions. With repeated attempts the child may be made not to be afraid of darkness. Conversely, a child may be shy to speak to a group in the begining of his acquaintance. The teacher at first makes him talk to two or three children ; then he is led to speak to small groups of class mates and friends ; and finally, he is thrown into his whole peer group to speak.

It has already been said that the conditioned response is quickly formed when there is constant repetition. Here the teacher is faced with two problems : one, with the stimulus ; and two, with the response. Learning occurs in a complex situation. A single stimulus may not represent the situation. Consequently, there is a need for repetition under varied circumstances. The response of an individual to a certain stimulus takes time, as many things are involved in giving a right response. Controls are impossible in human learning and it is also not worthwhile and desirable. The best control of response should, therefore, come from within the learner which may be called his motivated attention and this results through his understanding and intelligent perception. If the repetition is coupled with understanding and proper perception, then effective learning results.

A few practical problems may arise with regard to learning by conditioning :

1. There may be different stimuli to produce the same response and one stimulus may produce a variety of responses. The teacher must be alert to such situations and pass on these connections to the pupils by providing such experiences.
2. Again, if conditioning is always of specific stimulus-response connection, transfer of learning becomes very difficult.

Transfer is possible only in similar situations and the generalisations derived at may be erroneous because these may be based only on limited experiences.

3. Another drawback in this respect is that true and accurate generalisation on the part of the learner is only possible through this conditioning not until a long time has elapsed in learning.

4. The approach may also impel the learner to be so mechanical that a little change or deviation in the learning situation makes the learner puzzled.

Learning by trial and error. In trial and error approach, the learner at first does a number of things which do not serve his purpose at all. After several attempts of his trials he makes a successful response. How does the learner retain this learning? After quite a number of repetitions, it is found that unsuccessful attempts are given up and successful ones are acted upon. By way of practice, the learner comes to a stage when he does not make a single mistake.

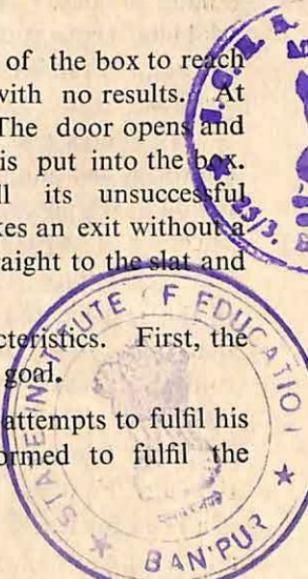
The above description will be made clear by Thorndike's animal experiment.

A cat is placed in a box which has a door at one end. A hinge is so arranged at the door that a light pressure on the floor slat near the door helps it to open. A dish of fish is placed on the floor outside the box near the door which the cat cannot reach from the box.

The cat is hungry and wants to get out of the box to reach the food. It makes many accidental attempts with no results. At one instance, it happens to step on the slat. The door opens and the cat is out. Again and again, the cat is put into the box. Gradually, the cat rejects and abandons all its unsuccessful attempts. After many a attempt the cat makes an exit without a single mistake. Towards the end, it walks straight to the slat and opens the door.

This method of learning has four characteristics. First, the individual has a motive, a need, a purpose or a goal.

Secondly, the individual makes several attempts to fulfil his desire. Various kinds of activities are performed to fulfil the purpose.



Thirdly, the individual eliminates the wrong kinds of activities or the activities which seem to be of no use.

Finally, he establishes his desire through successful attempts.

There are two facets to this kind of learning: first, the appearance of the correct behaviour; second, skill in its execution. At first, the learner attempts all kinds of hit and miss trials before spotting out the correct response. Secondly, by practising it he learns the skill.

Here, a differentiation has to be made between repetition and practice. Repetition strengthens an act of an individual by making it less likely to be forgotten, but practice helps in the improvement of carrying out the act. In other words, practice eliminates errors and improves the response. When the correct response is established it may be firmly fixed or strengthened by repetition. One may learn through conditioning by repetition alone without seeing any relationship between the stimulus and the response. One may improve in skill by practice through trial and error approach without understanding any kind of relationship. In the above context, it is possible that trial and error may precede conditioned learning.

In the conditioned response learning the responses are regarded as unrelated parts and they are made to act by some external stimuli or cues. The emphasis here is on environment. In the trial and error approach the emphasis is on the motives of the learner, his random activities which ultimately leads him to 'chance success.'

In contrast to the conditioned response learning, trial and error approach has many factors to consider: the role of individual's freedom, his needs, drives and purposes, his random responses, his selection of the correct response and his incentives.

In the latter, the learner is given the latitude to find his way. In this respect, the learner has more freedom in the second method than in the first. The teacher must realise that the factor, prerequisite to the success of any learning, is the freedom of the individual. Then only the teacher can become a guide and helper and not an authority figure. At the same time, the teacher must be careful to the learner's needs and desires, so that he can give help when there is a need for it. Otherwise, the learner may face many difficulties and failures which may hinder his progress in learning.

An individual who has drives and purposes in view is able to participate. The activity is not possible without motives. An individual learns by doing and his active response comes from his understanding. Purpose favours in motivating a person, motivation helps in activating a person ; and activity helps in learning.

A person tends to make more of random responses when he has limited experiences and is devoid of inner drives. It is for this reason of helping the child to gain from experience and to develop these inner drives that the teacher prepares lesson units, has graded learning activities and a planned course of study.

The selection of the correct response of the individual rests on his accurate perception which is gained from experience and on his understanding of the relationships between various parts in the learning situation. From the very outset, teacher's attention should be directed towards providing rich and systematic experiences to the child through his learning activities so that the child may be helped to understand and perceive what he sees and what he does in the broad perspective of his total learning.

1. Like conditioning, the trial and error method is more suitable for young learners who have lesser understanding of things around them and lesser experience of their surroundings.
2. This approach is useful when one uses more of his hands and feet rather than his head. The trial and error method is a fruitful method to develop all kinds of manual skills.
3. This method is helpful when one has too difficult a problem and when his understanding is too limited.
4. Nevertheless, it also assists the teacher to understand the significance of motives, and incentives in any learning.
5. Further, it helps the teacher to know how a learner selects the appropriate and correct responses at a particular point.
6. Finally, it throws a volley of problems to the teacher as to the practical implications of his work, methods and procedures as a guidance personnel in this learning process.

But a word of caution : If this approach is to be applied solely in the learning process, it may consume much of the learner's time ; and learning may become very laborious to the learner if there is no proper guidance at the right time.

Learning by insight. This approach of learning was introduced by the gestalt psychologists. The word gestalt is German in origin and it means 'shape' or 'form'. These psychologists advocate that the learner's response is to the relationships in the field (the total pattern of things) and not to the isolated objects. The important thing in this learning is the significant relationship or pattern or 'configuration.' The gestalt psychologists insist that all learning is accompanied through insight. In their own words, this learning can be described as follows: Insight means the process of establishing new organised wholes. The insight achieved is the how and why of situation, an understanding of the innermost realm of the field, the stress not merely apprehended but comprehended. The method, therefore, involves understanding and seeing relations between things and then obtaining the insight. 'It is not a matter of repetition as conditioning, nor of practice as in trial and error, it is understanding.' In insight, the emphasis is on perceived relationship. Both the learner and his field (the total field of events) are treated as an 'interacting system.' The learner with a goal in view finds the relationship between means and ends; and reorganises his activities in such a way that suddenly he achieves his goal. Though it comes suddenly, yet it comes through understanding. Again and again, it may be emphasised that in insight the learner sees a relationship between 'parts and whole of learning'; he sees the adequacy and relevance of what he does to the total learning situation. As soon as he gets to understand the concept immediately he applies it to his purpose. Learning, then, becomes less repetitive and less difficult to retain and recall. Here comes the economy in learning on which this method relies. This economy is supposed to be its greatest contribution.

To give an example of insight approach to learning we have to refer to Kohler's study on the chimpanzee.

A chimpanzee is placed in a cage. Outside the cage, on one side are some bananas. The chimpanzee is hungry. Its long arms can not reach the bananas. Within the cage are some sticks near the door of the cage. It first tries to reach the fruit with its hands. Of course, it meets with failure. This continues for some time with various kinds of attempts. Suddenly, the chimpanzee jumps, seizes a stick and very clearly pulls the bananas.

From the above, the steps in insight learning may be described as follows :

- (i) The learner perceives a situation.
- (ii) He acts on this perception and redefines the situation in a new perception.
- (iii) He acts again on this new perception and redefines the situation.
- (iv) This process goes on and finally, he solves the problem all of a sudden. That is to say, that suddenly the learner achieves the insight.

In accounting for this learning of the chimpanzee, Kohler emphasizes that 'the solution always seems to come abruptly as a flash in insight. It comes about by the learner perceiving the relationship in the scene, rather than by responding to isolated stimuli as held by conditioned response psychologists.' In conditioned response method, the action is viewed mechanically as though the connection is formed by forcing the responses to appear again and again.

Both Kohler and his associate, Koffka make it clear that the random trials of the chimpanzee are all but meaningful attempts. These are not mere blunders. This statement of their's differs from that of Thorndike, who explains this only by his Law of Effect.

The two approaches—trial and error and insight—confirm each other in emphasizing motives in learning, but the role of motives is reinterpreted in the latter in a very different manner. In the trial and error learning random activities result in 'chance success'. According to the insight method, a motive (i) accelerates or gives impetus to the goal stimulus ; (ii) systematises the perceived field of events ; and (iii) makes the learner to act and use his previous knowledge and experience to the situation. As experience has to play a vital role in learning the teachers should take note of how to plan and develop learning experiences at school. The fact is that the teacher should begin with easy activities and gradually work towards a more difficult task. Too vast a difference in meaning and structure may force a learner to fall back to the process of trial and error.

There is an agreement in all these approaches on the importance of activity on the part of the learner in the learning process. In conditioned response the activity is more or less mechanical ; in trial and error it is said to be influenced by the Law of Effect ; and in insight the activity rests upon the learner's understanding and perception.

The three approaches again ascertain that in some way or other all learning is associative in nature, but 'they differ in their conception of the essence of the process.' In conditioned response, the emphasis is on the environment ; in trial and error method, the stress is on the motives of the learner ; and in insight learning, the significance lies on the perceived relationship between the learner's motives and his field of events.

Conditioned response learning tends to neglect 'the whole of learning' and the insight learning is inclined to neglect the conditioned responses.

Insight approach to learning tells us what the learning ought to be. It points out to the slow and laborious repetitions of the conditioned response and trial and error learning.

But how does insight come about ? No definite way or path may be recommended or prescribed for the purpose. It may, however, be said that certain conditions seem to be necessary to bring it about. In the classroom, the giving of information and the question and answer techniques as teaching methods may favour this insight learning. In the beginning the learner has to depend on conditioning and trial and error before insight.

This method is of tremendous help to the teacher in the task of problem-solving. He is also made aware of certain factors which may cause hindrance to the learner's achieving the insight. These are : (i) lack of adequate motivation and lack of sufficient experience ; (ii) disorganised elements in the learning situation ; and (iii) the powerful influence of old habits and ideas which may block the learner's vision to see new relationships or association.

PROBLEMS RAISED AND SOLVED

The three approaches to learning namely : conditioned response, trial and error, and insight fall under two main learning theories classified as association theories and field theories. The former

stresses the response of the learner, its bond with a definite stimulus and the behavioural changes of the learner ; whereas the latter emphasizes the learner's perception of the whole field of events. Guthrie, Thorndike and Hull are the proponents of association or stimulus-response theories. Lewin, Tolman and the gestalt psychologists are the advocates of field theories.

Both Guthrie's *Contiguity theory* and Thorndike's and Hull's Reinforcement theories put emphasis on the effects of the environment, the bond between the responses and the stimuli, the significance of previous experience and the emergence of the whole from its part elements in learning. On the contrary, to the field theorists perception and cognition of the learner, the whole rather than the parts, and the relationship between parts are of vital importance.

The main difference between these two theories centre on 'Whether learning is a change in perceptual organisation or a change in stimulus response connections ; and whether or not reinforcement is an essential condition for the occurrence of learning.'

The different methods of learning have each championed a separate learning theory. Both teaching and learning have immensely improved by the contributions made by these approaches. Each of these concepts have added something to the complete understanding of the learning process which is so complex. No 'one approach' is adequate enough to give a thorough understanding of the different phases and various types of learning. To illustrate this, it can be said that principle of readiness, exercise, effect, insight, whole patterns, conditioning, practice, primary association and concomitant learning has each its own use and value in describing and explaining what takes place in the learning process.

SECTION IV

THE TEACHER EVALUATES TEACHING LEARNING PROCESS

Teacher's Role in Providing Learning Experiences. We teachers do realise that we have to deal with three types of elements in the teaching-learning process : one, the environment ; two, the child ; and three, the subject matter and its presentation. The teacher may deduce the following from the foregoing study of the learning process :

The environment. The teacher at the very outset sets the stage or environment for effective study of the pupils.

- (i) He locates a definite place of study.
- (ii) He provides favourable physical conditions for learning such as proper light, adequate space and ventilation, etc.
- (iii) He plans and follows a definite time schedule for study—what to study, when to study and how to study.
- (iv) He defines a purpose for study.

The child as a learner. A wise teacher takes note of the following :

- (i) There are individual differences in learning ; and therefore, learning is an individual approach. This may however differ from child to child or within the same child when his learning takes place under different situations and conditions.
- (ii) The goals or standards should not be set up beyond the capacity of the learner.
- (iii) Previous experience of the learner is fundamental in the process of learning.
- (iv) Knowledge of one's own performance, mistakes and information of successful results helps in learning.
- (v) Active participation by the learner is essential in learning.
- (vi) Motivation is powerful influence in determining effective learning.

- (vii) A motivated learner can acquire knowledge and understanding more quickly than one who is not motivated.
- (viii) Excessive motivation may sometimes be less effective in some kinds of learning. In some instances it may result in 'pushing' the child too much disregarding his abilities.
- (ix) Motivation by success is preferable to motivation by failure.
- (x) Learning depends on the mental set or the mood of the moment of the learner. The teacher has to find out whether the learner is ready, for the task or not. If not, what are the ways and means to make him ready for the purpose.
- (xi) Emotion of the learner is a powerful factor in learning and the teacher must learn how to use this to his greatest advantage. In this respect the good inter-personal relationships in the classroom as well as in the school should not be neglected by the teachers.
- (xii) Good study habits of the individual also promote learning.

Subject material and its presentation. In the course of formal and informal teaching, a resourceful teacher plans and directs pupil experiences which lead to effective learning. What are the criteria on which he bases these experiences and how does he fulfil this purpose ? The study of the learning process enables the teacher to make certain deductions, with the help of which he tries to affect purposeful learning in pupils :

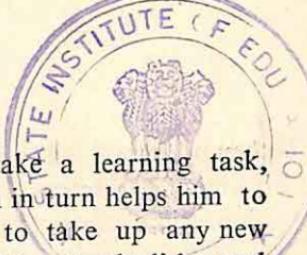
1. By following certain principles to guide the pupil's learning activities ;
2. by considering the maturity and the capacity of the learner ;
3. by employing fruitful motivational devices ;
4. by directing and modifying perception of the learner ;
5. by using practice most effectively ;
6. by removing emotional disturbances, and
7. by directing teaching towards transfer.

1. The general principles which guide the teacher in planning

the learning activities for the pupils are the following :—

- a. *Self-recitation* : In order to understand and remember the content in any subject the teacher may ask the pupils to frame their own questions, to develop outlines with certain guide words, etc.
- b. *Verbalisation* : Sometimes verbalisation on the part of the teacher explains and clarifies what the pupils are expected to do even in learning certain motor skills, like typing, singing and dancing.
- c. *Meaningful approach* : Permanent learning takes place when pupils understand the meaning, relationships between things, differences between them, etc. Teachers use methods and procedures to explain and emphasize these ideas.
- d. *An overall view* : At the outset an integrated and unified approach rather than a piece-meal approach is more meaningful to pupils to grasp the total learning situation.
- e. *Efficient mode of attack* : An efficient mode of attack in learning is to proceed from the simple to the complex, from the familiar to the unfamiliar or the new ; from the concrete to the abstract, from the easy to the difficult and from the recent to the remote, etc.
- f. *Mnemonic* : Mnemonics may be used with great caution and advantage at the initial stage of learning without hampering efficiency to progress.
- g. *Economy in learning* : Different ways of attacking a problem may be tried to prove to the pupils which one is the most efficient mode of attack for learning.
- h. *Problem-solving approach* : Sometimes the pupils may be asked to teach themselves how to learn by presenting them with a problem, if they are mature enough to undertake this activity.

2. In teaching children, it is important to remember that their learning activities must be fitted to their maturity level. The general pattern of child development is that with age the child gains new capacities. As he matures, these capacities develop into abilities and he improves his skills.



If the child is mature enough to undertake a learning task, his initial success gives him satisfaction, which in turn helps him to develop interests. He then gains confidence to take up any new kind of activity. On the contrary, if the child is 'pushed' beyond his level of maturation and capacity his learning becomes not only slow but he loses interest, feels inferior, becomes dependent and develops mechanisms for self-defence. Sometimes, he may even become aggressive and rebellious.

Another factor, which is related to the physical and mental maturity of the child is its readiness to learning. Child's readiness to learn may also depend on his interests besides his developmental sequence, physical and mental maturity. It is not difficult to discover child's readiness to learning.

This can be easily detected in childrens' preferences of school activities, their leisure time hobbies, etc. When readiness aptitude tests are not available a teacher can find these out by observing the pupils and their activities and by holding interviews with them. Child's readiness to learning also indicates a favourable condition for effective learning. In providing any learning activity the teacher has to determine the physical and mental maturity of the child together with its readiness to learning. If the child is not ready, he tries to get at the causal base and finds ways and means to develop this readiness in the child.

In general, it is accepted that it is of little use to try to teach a child when he is not 'physically, intellectually, emotionally and experientially' ready to learn. To force him to learn without his willingness creates circumstances which may lead to all kinds of maladjustive behaviour, on the part of the child. Readiness is sometimes described 'as an interrelation between biological, developmental, experience and method of instruction.' Though it is difficult to achieve readiness all the time, for all pupils yet when teachers come to know and understand their pupils better as individuals and as groups, there is less violation of this rule. It is unwise to make children remain quiet and silent for a long period of time. Only with age they learn to discipline themselves. The rule of readiness is violated when we want our pupils to learn materials that have slightest or no relation to their experience. Sometimes children may not be ready to learn certain subjects when these are presented in one way but can learn the same when

they are presented in a different way. As the state of readiness is one of the potent factors in learning, an intelligent teacher makes all possible efforts to motivate the child for any learning activity.

3. It is often said that motivation and incentives for school work can be developed out of four basic human motives namely : 'innate physiological drives, general positive striving activity drives, learned social motives and learned individual interests, ideals and identification.'

These motives or inner drives within an individual really determine the intensity of his learning effort. Motives are also modified by learning and thus can be directed to achieve certain goals. Teacher's incentives are meant to satisfy inner drives of children. It is a self-evident truth that efficient learning does not result merely through participation and repetition by the learner. The activity of the learner must be coupled with his high degree of effort to learn improvement in learning. Therefore, motivation is very essential to the learning process.

Teachers may use various kinds of incentives to motivate children namely : praise and reproof, cooperation and rivalry, working in the group or working alone, school marks and examinations, honour's roll and prizes, knowledge of result and self enhancement, etc. All these incentives, to some degree, stimulate learning, but some may be considered better than others. Usually positive incentives motivate a learner more than negative ones. Praise is positive and more effective as a motivating factor in learning than reproof. Though positive motivating procedure is preferred to the negative one, the teacher may be cautious to use this with discrimination. Even praise and encouragement when applied in wrong situations may produce undesirable results. It is also said that praise works better as an incentive with younger children and less bright ones. Examples like these indicate that teachers may use those incentives that help pupils achieve a purpose and direct them to greater success.

The highest motivating factor for meaningful and effective learning is the learning goal. The goal of learning must never be vague and undefined. Goals may be intrinsic or extrinsic, immediate or remote, vague or precise, high or low according to the level of aspiration. Intrinsic motivation is preferable to extrinsic one.

In general, immediate goals appear to be more effective organisers of learning activities than remote ones. The fulfilment of immediate goal may help in reaching the next one. In this way, the learner comes to understand and achieve the long termed goals. Well defined goals have the advantage in motivating the learner. Through such goal setting, the learner is able to measure his performance and thus the learning process itself becomes motivation for further learning. Goals may be determined directly by motives of the learner from within or indirectly by incentives from without. In this context, the will of the learner is all important for it is the source as well as the force of all achievement. It may also be an inhibiting force to learning because it is the determining factor which decides for the individual whether to follow the action till the goal is reached.'

4. Perception is the essential foundation for all forms of learning. 'Perception is the meaningful apprehension of the sensation.' Merely seeing a picture is sensation. When we get the sensation of its colour, softness, perspective, etc. it becomes perception. Perception may be described in another way 'as an integration of sense impressions into a meaningful pattern.' As sensation is prerequisite to any kind of perception the primary duty of any teacher is to give sense training to his pupils from the very beginning.

Children's perceptions vary with age. In the beginning at the early stage of growth their perceptions are meagre and indefinite. As they grow and mature their perceptions become richer, more definite and more detailed in observation. 'Young children perceive things as whole rather than as a sum total of its parts, and apprehend discrete objects earlier than their spatial and temporal relations.'

Children may improve their perception if the teacher

- a. allows them to explore and manipulate,
- b. gives opportunity to have a variety of experiences in a rich and suitable environment,
- c. directs their observations with certain guide points, and
- d. guides them with the help of adequate and appropriate questions.

Attention and interest help in selecting stimuli for perception. These two are basic not only to perception but also to motivation. Thus the teacher's greatest task is to cultivate in his pupils favourable attitude which will not interfere with their attention and interests. But how to achieve this ?

In the beginning children's attention is drawn by novel and striking situations. Children at first pay attention to things and not to ideas, and thoughts. It is through teacher's direction that the children are able to change over from the former to the latter. At the outset of learning, in some cases the teacher has to make deliberate attempts to direct the attention of children towards learning. This is voluntary attention. But through the conscious effort on part of the teacher, the child is able to develop spontaneous attention.

Attention is of great classroom importance. It is a valuable aid to memory, achievement and efficiency in work. Attention also leads to interest. It is said : 'Interest is talent attention ; attention is interest in action.' Interest determines attention and attention gives rise to interest. The teacher in helping to develop one also helps in developing the other. Interest of the children can be easily aroused if the teacher keeps in his mind, the age, and capacity of the learner. Their interests can be sustained in the class if the teacher uses different kinds of 'pupil-centred and life-centred approaches' instead of 'teacher-centred or book-centred approaches' in the learning situations.

5. For gaining mastery in different kinds of school work the child requires repetitive practice. Though practice is a condition of learning it needs other conditions too. It becomes effective when it is coupled with maturity, capacity, readiness, perception, and motivation of the learner.

- (a) Practice-results rest on a suitable learning environment of the child—his classroom, his school, his home and his community. Each must provide the child with facilities to carry out practices which the child can avail of.
- (b) Systematic and functional practice has better results than incidental practice. Incidental practice sometimes becomes meaningless to the learner.

- (c) The appropriateness of the time for practice arises when there is a need for it. Then practice becomes meaningful, purposeful and efficient.
- (d) For learning meaningless material the child needs more practice. Conversely, with few repetitive practices the child learns more meaningful materials without reducing learning efficiency.
- (e) The advantages of distributed or massed practice depend upon the following conditions : Shorter practice periods on repetitive activities like memorizing a poem, spelling and hand-writing are more beneficial.

Longer practice periods are necessary when the child is trying his hand in organising his thoughts for creative work.

The length of the rest periods also has its effect on learning. The rest period should not be too long ; otherwise, this may result in forgetting.

- (f) No definite conclusion is arrived at about relative efficacy of practice of the whole versus part methods.

It is suggested that intelligent and mature children, with a background of rich experiences may find the whole method approach more favourable. On the other hand, practice in part method is found to give better results in young children.

But there are advantages in both these approaches. If the whole of the learning task is not too big, then the practice in whole method seems to be superior for many individuals.

Practice may also lead to fatigue which may reduce the learning capacity of the pupil. A teacher has to look out to this in order to avoid it at all cost in school work.

6. Emotions may be constructive as well as destructive in any learning situation. Children's fear, anxiety, frustration, insecurity, feeling of inferiority work negatively towards his learning efficiency. These can be eradicated if the teacher from the outset tries to build up the 'self-concept' in the child. This can be attained with the help of

- (i) suitable curriculum,

- (ii) methods of teaching,
- (iii) guidance in personal problems, and
- (iv) parent-teacher conference.

A child may be emotionally disturbed if he has any physical defects or deformities. An early remedy may be sought to remove these. If this is not possible, the child may be helped to adjust to this misfortune of his.

In school, failure in work may be one of the causes for emotional disturbances. Here again the child needs teacher's help and guidance. The teacher must plan and organise his classroom activities in such a way that he may prevent this maladjustment. If by any chance he detects this disturbance among his children, he must find ways and means to remedy it.

7. It has already been pointed out in the previous section that transfer may take place through similarity of contents, similarity of relationships, similarity of techniques, and similarity of principles.

The first and the foremost concern of the teacher in this respect is to make a conscious attempt to direct his teaching towards securing this transfer even though these similarities may exist. This transfer should not be left to chance.

Pupils may be given enough opportunities to master these principles. Pupils need practice on varied applications of these principles in different but similar situations.

Pupils may be made sensitive and alert to develop such habits and skills which in turn may enable them to make new applications or adaptation of the previous principles.

On the contrary, transfer through generalization is also equally important, and it is a condition of learning. This helps a pupil to generalise and again apply this generalised conclusion in particular situations. In this way, children develop attitudes and ideals. It is not always important to retain or recall facts or specific information. In this context, it may be said, that we have forgotten many things that we had learnt when we were young but the skills and attitudes that we have developed in the learning process are our proud possessions today. In that very process of learning we used our minds to analyse, organise and generalise. It is this

discipline which enables us to examine and evaluate any new experience and develop improved methods to tackle new learning experience.

All the above examples belong to positive transfer. Transfer may be negative. When any interference takes place in the learning situation, transfer does not take place. The teacher must be on his guard not to allow any negative transfer to creep in. How can a teacher help in this positive transfer ?

- (i) He should provide learning experiences in such a way that the pupils may detect similarities and differences in objects, situations and ideas.
- (ii) He may encourage pupils to apply their old experiences to new situations.
- (iii) His teaching approach be of great help in this respect : such as project method, heuristic approach, problem-solving approach, etc.
- (iv) While teaching one subject, he may correlate it with other subjects of the same curriculum.
- (v) An integrated curriculum may also help in this transfer.
- (vi) His planning and organisation of the materials be such that it may contribute to maximum transfer.

EVALUATION OF OUTCOMES FROM LEARNING EXPERIENCES AND APPRAISAL DEVICES

Evaluation may be considered as the last phase of study in the investigation of learning. The learning experiences provided by the teacher are based on some criteria and thus these attempt to fulfil certain objectives. Thereby, the study of learning may remain incomplete if the teacher does not evaluate the outcomes of learning experiences. With the help of evaluative procedures the teacher is in a position to judge the adequacy of subject matter, efficacy of the methods of presentation of materials, and efficiency and competence of himself as an instructor and guidance personnel.

Measurement and evaluation are not identical terms. Measurement answers the question, 'How much?', whereas evaluation gives answer to : 'what value?' Evaluation, therefore, implies pupil growth and development in context with educational goals that are set up. The major purpose of evaluation is to improve instruction. Hence, it is necessary to examine how much of effective and worthwhile learning has taken place. The purposes of evaluation may be enumerated as follows :

- (i) Evaluation helps in clarifying and redefining the objectives of education such as : What are the desirable objectives ? How much has been achieved or attained ? What progress has been made by the teacher in this direction ?
- (ii) Evaluation helps in motivating student's learning.
- (iii) Evaluation assists in appraising pupil growth and development by interpreting this developmentally.
- (iv) Evaluation helps in providing and adapting courses and programmes to the needs of individual students.
- (v) Evaluation helps in framing adequate and reliable tools of measurement. An evaluative tool is of little consequence if it does not accelerate such improvement.

Consequently, continual and effective use of evaluation certainly facilitates learning. Evaluation and measurement of pupil achievement are integrally related to the learning process. A

variety of appraisal devices are needed to evaluate and measure the attainment of habits, skills, knowledge, understanding, attitudes and ideals in several curriculum areas.

In the same subject area, it is also essential that the teacher evaluates the pupils in the following :

- (i) development of motor skills (if any) and verbal skills ;
- (ii) modification and improvement of perception ;
- (iii) development of understanding, comprehension and concept formation ;
- (iv) capacity for problem solving ;
- (v) acquirement of right attitudes and the modification of the previous ones ;
- (vi) development of interests and appreciation, and
- (vii) the amount of transfer.

But it should rest on the discretion of the teacher on which phase or phases (as mentioned above) would he like to place more or most emphasis during his evaluative process. Now the question arises : when should a teacher evaluate his pupils ? There is no hard and fast rule regarding this time factor. However, it may be mentioned that this solely depends on the teacher : when and how often he would like to evaluate. There are certain things which have to be assessed daily and continuously ; some, more frequently than others ; and the rest, periodically. An alert teacher makes note of all these and builds up his total evaluative process accordingly. But one word of caution : evaluation should never be 'sporadic', just to fill up the gap in the time-table of the class or the time schedule of the school. The teacher must have reasons : Why he needs to evaluate his pupils ? He must be always on the look out for this 'opportune moment'. Another general principle that a teacher must remember is that evaluation must be taken as a continual developing programme of the educative process to see pupil growth and development in one area or in several areas.

For this purpose, the teacher has to acquaint himself with the various kinds of appraisal devices and discover for himself which ones will serve him best in assessing different phases and aspects of learning. A few of these devices may be mentioned below :

(i) Observation, (ii) interviews, (iii) teacher made achievement tests : objective type, essay type and mixed type, (iv) performance tests, (v) diagnostic tests, (vi) personality tests of various kinds, etc.

Much can also be known from other sources like parent-teacher conferences, staff meetings and cumulative records of the pupils.

It is not the purport of this study to go into the details of evaluative procedures which may form a separate theme for discussion. The main reason for its inclusion here is to highlight the importance of : what to evaluate, when to evaluate and how to evaluate, in the total learning process.

A LOOK AHEAD

The continuing problem of the classroom teacher is to keep himself up-to-date and well-informed of the day to-day research findings in the process of teaching-learning. It has been pointed out that educational research is useful to a teacher in at least three ways :

1. 'by helping him to develop an alert, sensitive attitude to the advancing edge of human knowledge,
2. by supplying him with facts whereby he can improve his own work ; and
3. by stimulating him to go on beyond existing research findings to discover additional facts for himself.' In this regard, teacher's task is threefold :
 1. to know where to look out for the research studies ;
 2. to understand the findings ;
 3. to apply these in his teaching techniques either to check whether the results are fruitful or to find out some additional facts connected with the findings.

These may enable him to develop and organise a set of principles and procedures which will have maximum practical value in the guidance of children's learning. How many of us do really realise this great task that has been entrusted to us.

APPENDIX I
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APPENDIX II

FILMS TO STUDY AND DISCUSS *

1. How to Learn ?
2. Learning is Searching.
3. New Tools in Learning.
4. How to Remember ?
5. Experimental Studies in Children's Learning.
6. Motivation and Reward in Learning.
7. How to Study ?
8. How to Think ?
9. Learning from Class Discussion.
10. The Problem Method.
11. Developing Imagination.
12. Symbols of Expression.
13. Your Child is a Genius.
14. Child on Trial.
15. Learning to Understand Children.
16. Teaching.
17. Who Will Teach Your Child ?

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